

**Abstract**

The present invention provides an inexpensive solid-state polymer electrolyte membrane to be used in a solid-state polymer electrolyte fuel cell, which can be manufactured by using inexpensive raw materials through a simpler chemical synthesis process, achieves good heat resistance and demonstrates superior proton conductivity at low humidity. A primary constituent of the solid-state electrolyte polymer film to be used in a solid-state polymer electrolyte fuel cell according to the present invention is a hyperbranched polymer having an acidic functional group such as sulfonic acid disposed at the terminal of a side chain thereof. The hyperbranched polymer may be, for instance, poly [(bis(oligo-ethylene glycol) benzoate)].